
Development and Intercomparison of Methodologies to Measure Ferrous Iron in Seawater

A Data Management Plan created using DMPTool

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Affiliation: Non Partner Institution

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Project abstract:

There is an urgent need in the ocean science community for accurate, unambiguous measurements of iron(II) (Fe(II)) in the marine water column. Without these data it is impossible to obtain a complete understanding of the iron cycle and its biological implications. While the luminol chemiluminescence method and existing data obtained from oxygen minimum zones are probably robust, this method may overestimate Fe(II) in the euphotic zone. Moffett proposes here take on the challenge of producing alternative methods that will be effective throughout the water column. This research will develop a methodology with independent chemistry to compare with the chemiluminescence in both regimes: the oxygenated euphotic zone, and the oxygen minimum zone, where nitrate is the primary terminal electron acceptor.

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Data Policy Compliance

The project investigators will comply with the data management and dissemination policies described in the NSF Award and Administration Guide (AAG, Chapter VI.D.4) and the NSF Division of Ocean Sciences Sample and Data Policy

Pre-Cruise Planning

Pre-cruise planning was carried out beginning 18 months prior to the cruise in consultation with Professor Marjorie Mulholland at Old Dominion University.

Our sampling was carried out with a trace metal rosette sampling system.

Description of Data Types

Concentrations of dissolved ferrous iron measured by two independent methodologies under development during the cruise. These samples will be obtained from trace metal clean external Spring Niskin Bottles. Other metals will also be measured from these samples.

CTD data collected using a SeaBird SBE CTD package; processing to be done using SeaBird's SeaSave software; data will include standard environmental measurements (such as pressure, temperature, salinity, fluorescence). File types: Raw (.con, .hdr, .hex, .bl) and processed and .cnv, .asc, .bt1) ASCII files. Repository: BCO-DMO

Cruise scientific sampling event log; will include event numbers, start/end dates, times & locations of instrument deployments. Will be recorded using the R2R event logger (if available) and on paper log sheets. File types: Excel file converted to .csv; scanned PDFs. Repository: BCO-DMO and Rolling Deck to Repository (R2R).

Data and Metadata Formats and Standards

All data stored in excel spreadsheets

Metadata will be prepared in accordance with BCO-DMO conventions (i.e. using the BCO-DMO metadata forms) and will include detailed descriptions of collection and analysis procedures.

In some cases the results are summaries of experiments (ie process measurements). Experimental data will include a full description of the parameters that were varied and how they were quantified.

Data Storage and Access During the Project

1. Shared network drive
2. External hard drives
3. NA

Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution

1. We anticipate data will be publicly available no later than 2 years after expiration of the project.
2. NA
3. NA
4. NA
5. Other researchers who work on iron redox chemistry in natural waters

Plans for Archiving

1. Submission to BCO-DMO and storage on external hard drive devices in my laboratory

Roles and Responsibilities

Data management is the sole responsibility of PI Moffett